BATTLE CALCULUS

AND

FIRE SUPPORT

One Team One Fight

PURPOSE

TO UNDERSTAND THE CONCEPT OF BATTLE CALCULUS AND TO APPLY THE CONCEPTS OF BATTLE CALCULUS FOR FIRE SUPPORT AND FA OPERATIONAL PLANNING

AGENDA

- DEFINE BATTLE CALCULUS
- IDENTIFY USES AND LIMITATIONS
- PROVIDE EXAMPLES

BATTLE CALCULUS DEFINED

- THE PROCESS OF USING DOCTRINAL OR MEASURED RATES, PLANNING FACTORS, SPEEDS AND OTHER DATA TO CONDUCT DETAILED ANALYSIS THAT SUPPORTS MILITARY DECISION MAKING.

- USING BATTLE FIELD CALCULUS ALLOWS COMMANDERS AND STAFFS TO ANALYZE RELATIVE COMBAT POWER, ESTIMATE AND VERIFY CAPABILITIES, TRANSLATE INTO MISSIONS, CONDUCT PREDICTIVE ANALYSIS AND ALLOCATE RESOURCES AT THE TIME AND PLACE NECESSARY TO DEFEAT THE ENEMY.

NEW TERM- OLD IDEA

- ADDS SOME SCIENCE TO THE ART
- FORCE RATIOS
- DEVELOPING TRIGGERS
- MOVEMENT TABLES
- JMEMS / GMET
- FM 101-5-10- AMMO, FUEL, CASUALTIES

USES OF BATTLE CALCULUS

- **PREDICTIVE ANALYSIS**- WHAT IS A LIKELY OUTCOME GIVEN WHAT WE KNOW?
- **ESTIMATE AND VERIFY CAPABILITIES**- HOW LONG WILL IT TAKE TO DO IT? HOW MUCH CAN I DO IN THE TIME / SPACE AVAILABLE? CAN WE DO IT? CAN THE ENEMY DO IT?
- **ANALYZE RELATIVE COMBAT POWER-** DO WE HAVE ENOUGH TO SUCCEED? HOW MUCH MORE DO WE NEED?
- **FEASIBILITY**- CAN THIS PLAN OR COA REASONABLY SUCCEED?

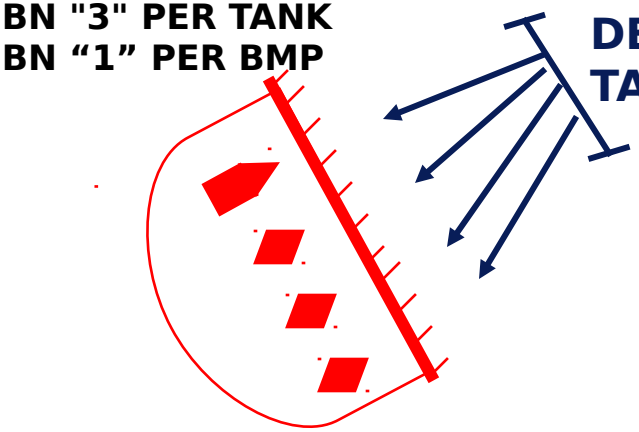
LIMITATIONS OF BATTLE CALCULUS

- BEST GUESS NOT MAGIC SOLUTION
- GARBAGE IN GARBAGE OUT
- THE MORE DETAILED YOU GET (THE MORE ASSUMPTIONS YOU MUST MAKE) THE LESS VALID THE BATTLE CALCULUS BECOMES.
- PLANNING FACTORS TEND TO BE AVERAGES- NO FACTORS PREDICT AUDIE MURPHEY OR SGT YORK.
- IT IS A PLANNING TOOL NOT A GUARANTEE OF SUCCESS OR FAILURE

FIRE SUPPORT BATTLEFIELD CALCULUS

- ACHIEVING THE REQUIRED EFFECTS FOR CDR
- HELPS PLAN DECISION POINTS AND TRIGGERS
- USED DURING COA DEV. AND WAR GAMING
- USES TIME, SPACE AND EQUIPMENT AVAILABLE
- DONE BY THE S2, TARGETING OFFICER, AND FSO
- APPLYING SCIENCE TO UNSCIENTIFIC ART
- ONLY A PLANNING TOOL

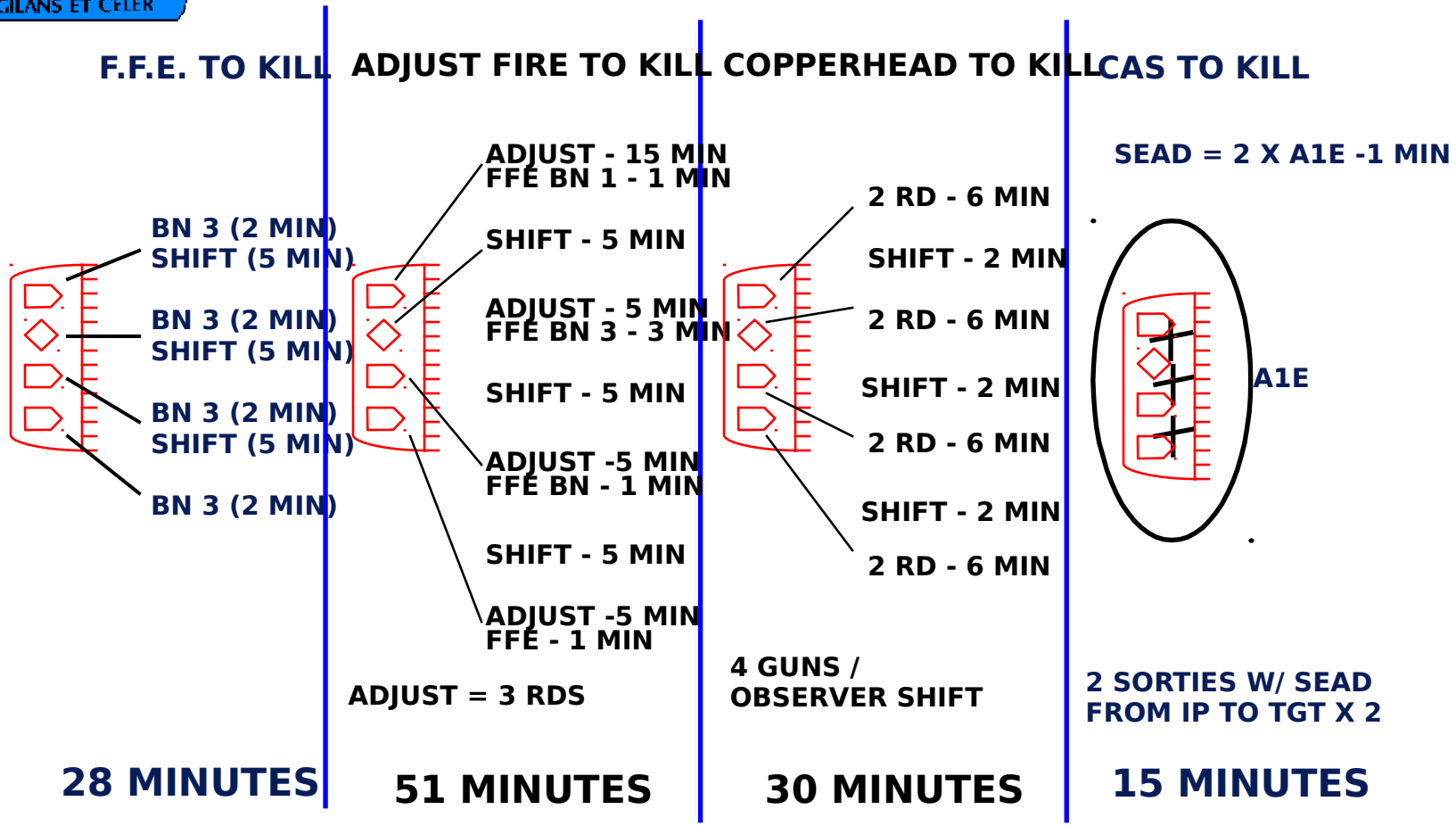
“DESTROY A MRP AT THE POP”



- **DESTROY TARGETS**
  - **1st VEHICLE BN “3” = 2 MIN**
  - **5 MIN SHIFT**
  - **2nd VEHICLE BN “1” = 1 MIN**
  - **5 MIN SHIFT**
  - **3rd VEHICLE BN “1” = 1 MIN**
  - **5 MIN SHIFT**
  - **4th VEHICLE BN “1” = 1 MIN**
  - **5 MIN SHIFT BACK TO SUPPRESSION TGT**
  - **TOTAL TIME = 25 MINUTES**

One Team, One Fight

TIME TO KILL AT THE POINT OF PENETRATION



FIRE SUPPORT BATTLEFIELD CALCULUS

COMMANDERS GUIDANCE

"I WANT TO DESTROY 1 MRCs WORTH OF COMBAT VEHICLES FROM THE FDMB IN EA CAT TO DISRUPT THE FDMB`S ABILITY TO SEIZE DEBNAM PASS FROM A COMPANY, IN ORDER TO LET ME MASS THE REMAINING 3 COMPANIES AGAINST THE REGIMENTS MAIN BODY IN EA DOG."

- **STEP 1. TRANSLATE COMMANDERS GUIDANCE INTO QUANTIFIABLE EFFECT**
  - CONSULT YOUR S-2
  - **1 MRC = 3 T-80s+ 8 BMPs**

FIRE SUPPORT BATTLEFIELD CALCULUS

- **STEP 2. EQUATE THE REQUIRED EFFECTS TO THE REQUIRED AMMUNITION**

NTC GMET DATA
TO KILL 1 TANK = 54 DPICM (155)
TO KILL 1 BMP = 18 DPICM (155)

THUS

- 3 TANKS x 54 RDS = 162 DPICM
- 8 BMPS x 18 RDS = 144 DPICM

306 DPICM

One Team One Fight

FIRE SUPPORT BATTLEFIELD CALCULUS

- **STEP 3. DETERMINE AVAILABLE MINUTES TO ATTACK**

FACTS	**ASSUMPTIONS**
•EA CAT IS 9 KM LONG	•FDMB IS 1KM LONG IN MARCH FORMATION
•30 KM = 1KM/2 MINS	•ENEMY RATE OF MARCH IS 30KMH

TIME AVAILABLE IN EA CAT

PASS TIME FOR FDMB = 2 MIN

9 KM x 2 MIN = 18 MIN

TIME AVAILABLE = 20 MIN

FIRE SUPPORT BATTLEFIELD CALCULUS

- **STEP 4. DETERMINE IF REQUIRED AMMUNITION CAN BE DELIVERED IN TIME AVAILABLE**

FACTS

- 1 FA BN = 18 TUBES (DS FA BN)
- RATE OF FIRE = 1 RD/ MIN
- FA BN CAN FIRE 18 RDS /MIN
- AVAILABLE TIME = 20 MIN (STEP 2)

- **MAX RDS IN AVAILABLE TIME = 20 x 18 = 360 RDS**

STEP 2 SHOWED US WE REQUIRED 306 RDS *SO WE ARE OK*

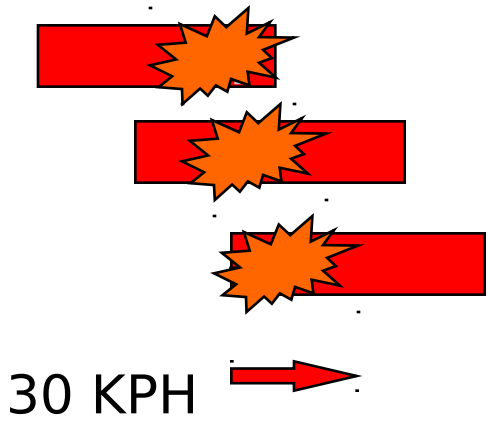
One Team One Fight

FIRE SUPPORT BATTLEFIELD CALCULUS

- **STEP 5. DETERMINE MAX VOLLEYS THAT CAN BE FIRED ON FDMB AT ONE TARGET LOCATION**

FACTS/ASSUMPTIONS

- FDMB IS 1000m BY 250m
- SPEED 30 KPH
- PASS TIME = 2 MIN



1st VOLLEY (TIME 0)

2nd VOLLEY (TIME 1 MIN)

3rd Volley (TIME 2 MIN)

3 VOLLEYS

One Team One Fight

FIRE SUPPORT BATTLEFIELD CALCULUS

- **STEP 6 . DETERMINE NUMBER OF ATTACKS (BN 3) NEEDED TO DELIVER REQUIRED AMMUNITION**

BN 3 = 54 RDS
WE NEED TO DELIVER 306 (STEP 2)

306/54 = APPROX. 6 ATTACKS

FIRE SUPPORT BATTLEFIELD CALCULUS

- **STEP 7. DETERMINE IF TIME AND SPACE IS AVAILABLE TO EXECUTE ATTACKS**

FACTS

BN SHIFT TIME = 3 MIN

DELIVER TIME BN = 3 MIN

SHIFT	•3 MIN	•3 MIN	•3 MIN	•3 MIN	•3 MIN	
	+	+	+	+		= 27 MIN
DELIVER	•2 MIN	•2 MIN	•2 MIN	•2 MIN	•2 MIN	•2 MIN

27 MIN = 13.5 KM (WE ONLY HAVE 20 MIN OR 9 KM)

One Team One Fight

FIRE SUPPORT BATTLEFIELD CALCULUS

WHAT CAN WE DO? VERY IMPORTANT

INCREASE AVAILABLE SPACE

OP FURTHER OUT TO ACQUIRE ENEMY EARLIER
CAN WE RANGE FURTHER OUT

INCREASE AVAILABLE TIME

SLOW THE ENEMY DOWN
FASCAM-OBSTACLES-JAMMING-SMOKE

INCREASE THE VOLUME

REINFORCING ARTY-CAS-ATTACK AVIATION
-USE COPPERHEAD

One Team One Fight

FIRE SUPPORT BATTLEFIELD CALCULUS

TRIGGERS

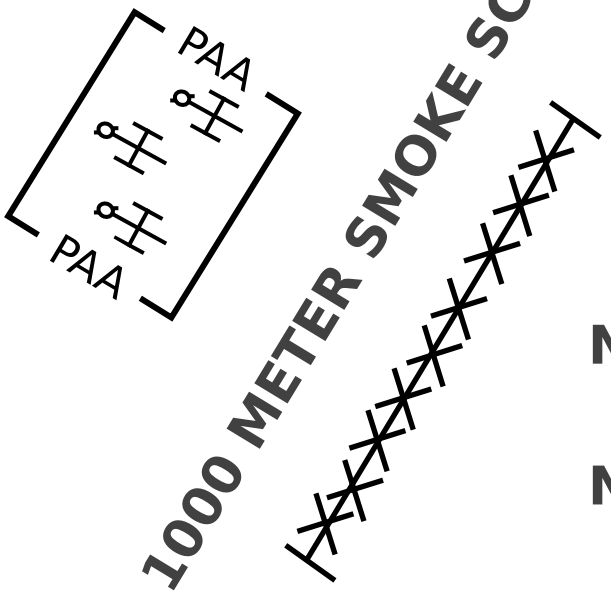
BATTLEFIELD CALCULUS WILL
HELP WITH PLANNING TRIGGERS

“ WHEN DO I NEED TO FIRE AT THE MOVING TGT?”`

“HOW LONG DO I NEED SCREENING SMOKE?”

One Team One Fight

OBSCURATION



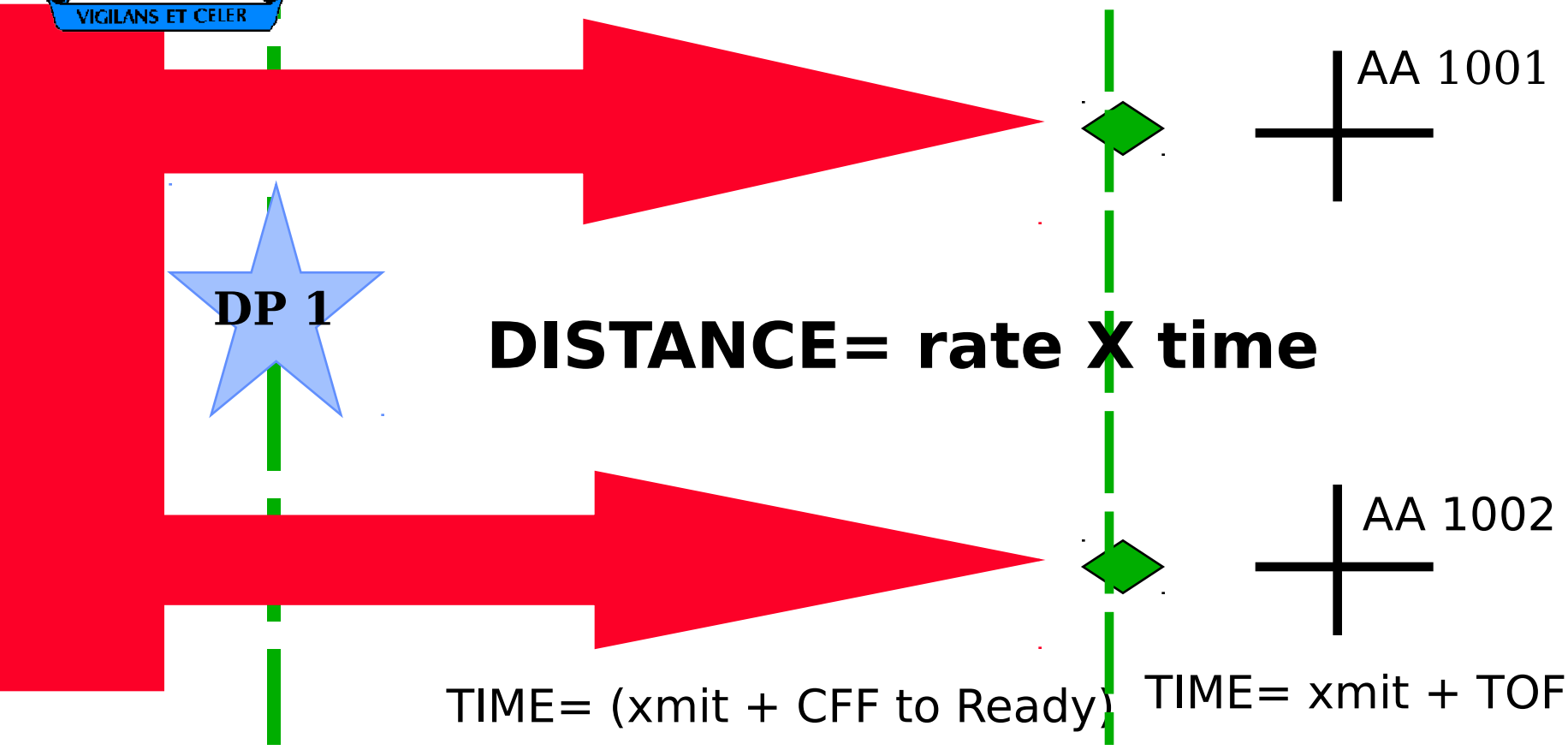
NUMBER OF AIM POINTS TO BUILD

NUMBER OF AIM POINTS TO SUSTAIN

SHIFT TIME FROM FFE TO NEXT FFE

One Team One Fight

Trigger Lines and Points EXAMPLE 2



BATTLE CALCULUS "RULES OF THUMB"

HOW LONG DOES IT TAKE?

(FROM "FIRE" TO EFFECTIVE)

OBSCURATION	**1st ROUND ADJ + 2ND ROUND + FFE + BUILD = 15-30 MINUTES**
DESTROY MRP	**BN 1 + SHIFT + BN 1 + SHIFT + BN 1 + SHIFT + BN 3 = 18-30 MINUTES**
IF CAS	**2 SORTIES W/SEAD: FROM IP TARGET X 2 = 20-30 MINUTES**
SUPPRESS	**GROUP TGT (3 BATTERY TGTs) W/ NO ADJUSTMENT 7-10 MINUTES IF ADJUSTING, ADD 7-10 TO EACH ADJUSTMENT**

SUMMARY

- BATTLE CALCULUS IS NOT NEW
- BATTLE CALCULUS IS NOT CALCULUS BUT APPLIED LOGIC
- IT GUARANTEES NOTHING EXCEPT THAT THE PLAN **CAN** WORK.
- IT CAN HELP DEVELOP BETTER MORE FEASIBLE PLANS
- IT APPLIES TO FS PLANNING
- YOU NEED TO HAVE A SMART BOOK OF PLANNING FACTORS TO HELP YOU
- IT GETS EASIER WITH PRACTICE AND BECOMES SECOND NATURE OR A RULE OF THUMB

FIRE SUPPORT
BATTLEFIELD CALCULUS

QUESTIONS ?

One Team One Fight

CONCLUSION

BATTLE CALCULUS, PROPERLY USED, PROVIDES A TOOLS TO DEVELOP FIRE SUPPORT PLANS THAT ***CAN WORK*** AND

THAT MAY BE ALL A FSO CAN PLAN ON.